Index

AASHTO, 1-3 AASHTO's Standard Specifications for Highway Bridges, 1-3, 3-1 abutment, 2-1, 2-4, 7-1 accessories, 1-1 AFCS, 1-3, 10-2 A-frame, 4-10 air photos, 2-3 allowable load, 9-2, C-1 maximum, 9-3 parallel to the grain, 9-2 perpendicular to the grain, 9-2 allowable pressure, 9-6 allowable stress, 3-19, 3-23, 8-15, 9-7 steel, 3-25 timber, C-1 allowable vehicle shear, 3-21 American Association of State Highway and Transportation Officials, see AASHTO American Society for Testing and Materials, see ASHTM analytical method, 1-4 anchor, 8-16 anchorage, 8-1 AO, 1-5 approach, 2-1 arrea of operation, see AO Artic and Subartic Environments, 12-1 armored vehicle-launched bridge, see AVLB AVLB, 1-3 B backhoe, 1-5 backstay slope, 8-3, 8-4 Bailey bridge, 1-3 backnoe, 1-5 backstay slope, 8-3, 8-4 Bailey bridge, 1-3 backnoe, 1-5 backstay slope, 8-3, 8-4 Bailey bridge, 1-3 backnoe, 1-5 backstay slope, 8-3, 8-4 Bailey bridge, 1-3 bleand failure, 6-1 bearing, 6-	Α	ASTM, 4-14	continuous-span truss, 3-8
AASHTO's Standard Specifications for Highway Bridges, 1-3, 3-1 abutment, 2-1, 2-4, 7-1 accessories, 1-1 AFCS, 1-3, 10-2 A-frame, 4-10 air photos, 2-3 allowable load, 9-2, C-1 maximum, 9-3 parallel to the grain, 9-2 perpendicular to the grain, 9-2 allowable pressure, 9-6 allowable shear stress, 3-20 allowable stress, 3-19, 3-23, 8-15, 9-7 steel, 3-25 timber, C-1 allowable vehicle shear, 3-21 American Association of State Highway and Transportation Officials, see AASHTO American Society for Testing and Materials, see ASTM analytical method, 1-4 anchor, 8-16 anchorage, 8-1 AO, 1-5 approach, 2-1 area of operation, see AO Artic and Subartic Environments, 12-1 armored vehicle-launched bridge, see AVLB B backhoe, 1-5 backstay slope, 8-3, 8-4 spackstay slope, 9-16 beam failure, 6-1 spackstay slope, 9-16 beam failure, 6-1 spackstay slope, 9-16 beam failure, 6-1 spackstay slope, 1-3 spackstay slope, 9-16 beam failure, 6-1 spackstay slope, 9-3 spackstay slope, 9-16 beam substructures, 12-4 spicker, 3-13 substructures, 12-4 spicker, 3-13 spuble-laminated stringer, 3-26 foundations and substructures, 12-4 spicker, 3-13 spleation, 6-1 spackstay slope, 9-3 substructures, 12-4 spring-in-1-3 spacker-3-1 spacker-3-1 spacker-3-1 spearing-6-1 spacker-3-1 spacker-3-	AASHTO, 1-3	AVLB, 1-3	curb, 3-12
Specifications for Highway Bridges, 1-3, 3-1 backhoe, 1-5 backstay slope, 8-3, 8-4 shocksoftes, 1-1 accessories, 1-1 backstay slope, 8-3, 8-4 fixed, 1-3 floating, 3-13 floating, 1-3 floating,			deck, 3-9
abutment, 2-1, 2-4, 7-1 accessories, 1-1 AFCS, 1-3, 10-2 A-frame, 4-10 air photos, 2-3 allowable load, 9-2, C-1 maximum, 9-3 parallel to the grain, 9-2 perpendicular to the grain, 9-2 allowable shear stress, 3-20 allowable stress, 3-19, 3-23, 8-15, 9-7 steel, 3-25 timber, C-1 allowable vehicle shear, 3-21 American Association of State Highway and Transportation Officials, see AASHTO American Society for Testing and Materials, see ASTM analytical method, 1-4 anchor, 8-16 anchorage, 8-1 AQ, 1-5 approach, 2-1 arrea of operation, see AO Artic and Subartic Environments, 12-1 arrored vehicle-launched bridge, see AVLB backstay slope, 8-3, 8-4 Bailey bridge, 1-3 balanced weld, 9-16 beam failure, 6-1 bearing, 6-1 beari		В	demolished, 1-1, 2-4
accessories, 1-1 AFCS, 1-3, 10-2 A-frame, 4-10 air photos, 2-3 allowable load, 9-2, C-1 maximum, 9-3 parallel to the grain, 9-2 perpendicular to the grain, 9-2 allowable shear stress, 3-20 allowable stress, 3-19, 3-23, 8-15, 9-7 steel, 3-25 timber, C-1 allowable vehicle shear, 3-21 American Association of State Highway and Transportation Officials, see AASHTO American Society for Testing and Materials, see ASTM analytical method, 1-4 anchor, 8-16 anchorage, 8-1 AO, 1-5 approach, 2-1 arrea of operation, see AO Artic and Subartic Environments, 12-1 armored vehicle-launched bridge, see AVLB Bailey bridge, 1-3 balanced weld, 9-16 beam failure, 6-1 bearing, 9-1 bearing, 6-1 bearing, 6-1 bearing, 6-1 bearing, 6-1 bearing, 9-1		backhoe, 1-5	expedient, 1-3
AFCS, 1-3, 10-2 A-frame, 4-10 air photos, 2-3 allowable load, 9-2, C-1 maximum, 9-3 parallel to the grain, 9-2 perpendicular to the grain, 9-2 allowable shear stress, 3-20 allowable stress, 3-19, 3-23, 8-15, 9-7 steel, 3-25 timber, C-1 allowable vehicle shear, 3-21 American Association of State Highway and Transportation Officials, see AASHTO American Society for Testing and Materials, see ASTM analytical method, 1-4 anchor, 8-16 anchorage, 8-1 AO, 1-5 approach, 2-1 area of operation, see AO Artic and Subartic Environments, 12-1 armored vehicle-launched bridge, see AVLB balanced weld, 9-16 beam failure, 6-1 bearing, 6-1	abutment, 2-1, 2-4, 7-1	backstay slope, 8-3, 8-4	fixed, 1-3
A-frame, 4-10 air photos, 2-3 allowable load, 9-2, C-1 maximum, 9-3 parallel to the grain, 9-2 allowable pressure, 9-6 allowable stress, 3-20 allowable stress, 3-19, 3-23, 8-15, 9-7 steel, 3-25 timber, C-1 allowable vehicle shear, 3-21 American Association of State Highway and Transportation Officials, see AASHTO American Society for Testing and Materials, see ASTM analytical method, 1-4 anchorage, 8-1 AO, 1-5 approach, 2-1 area of operation, see AO Artic and Subartic Environments, 12-1 armored vehicle-launched bridge, see AVLB beam failure, 6-1 bearing, 6-1 bearing, 6-1 girder, 3-13 glue-laminated stringer, 3-21 handrail, 3-12 iron, 1-1 M2 Bailey, 4-1 masonry, 4-20 masonry, 4-20 masonry-arch, 3-74, 3-75, 4-17 masonry-arch deck, 4-27 movable, 3-81 bending, 6-1 bearing, 6-1 substructures, 12-4 girder, 3-13 glue-laminated stringer, 3-21 handrail, 3-12 iron, 1-1 masonry, 4-20 masonry-arch, 3-74, 3-75, 4-17 masonry-arch deck, 4-27 movable, 3-81 bending, 6-1 substructures, 12-4 girder, 3-13 glue-laminated stringer, 3-21 handrail, 3-12 iron, 1-1 masonry, 4-20 masonry-arch, 3-74, 3-75, 4-17 masonry-arch deck, 4-27 movable, 3-81 bending, 6-1 bearing, 9-10 masonry-arch deck, 4-27 movable, 3-81 bending in the substructures, 12-4 mesorical substructures, 12-		Bailey bridge, 1-3	floating, 3-13
air photos, 2-3 allowable load, 9-2, C-1 maximum, 9-3 parallel to the grain, 9-2 perpendicular to the grain, 9-2 allowable pressure, 9-6 allowable stress, 3-20 allowable stress, 3-19, 3-23, 8-15, 9-7 steel, 3-25 timber, C-1 allowable vehicle shear, 3-21 American Association of State Highway and Transportation Officials, see AASHM analytical method, 1-4 anchor, 8-16 anchorage, 8-1 AO, 1-5 approach, 2-1 arrae of operation, see AO Artic and Substrice Environments, 12-1 armored vehicle-launched bridge, see AVLB failure, 6-1 bearing, 6-	AFCS, 1-3, 10-2	balanced weld, 9-16	floor stringer, 3-8
allowable load, 9-2, C-1 maximum, 9-3 parallel to the grain, 9-2 perpendicular to the grain, 9-2 allowable pressure, 9-6 allowable shear stress, 3-20 allowable stress, 3-19, 3-23, 8-15, 9-7 steel, 3-25 timber, C-1 allowable vehicle shear, 3-21 American Association of State Highway and Transportation Officials, see AASHTO American Society for Testing and Materials, see ASTM analytical method, 1-4 anchor, 8-16 anchorage, 8-1 AO, 1-5 approach, 2-1 area of operation, see AO Artic and Subartic Environments, 12-1 armored vehicle-launched bridge, see AVLB bearing, 6-1 bending, 9-9 bending, 11-17 bending, 9-9 bending, 11-17 bending, 9-9 bending, 1-1 bending, 1-1 bending, 1-1 bending, 1-1 bending, 1-1 bend		beam	foundations and
maximum, 9-3 parallel to the grain, 9-2 perpendicular to the grain, 9-2 allowable pressure, 9-6 allowable stress, 3-20 allowable stress, 3-19, 3-23, 8-15, 9-7 steel, 3-25 timber, C-1 allowable vehicle shear, 3-21 American Association of State Highway and Transportation Officials, see AASHTO American Society for Testing and Materials, see ASTM analytical method, 1-4 anchor, 8-16 anchorage, 8-1 AO, 1-5 approach, 2-1 armored vehicle-launched bridge, see AVLB bending, 6-1 lateral deflection, 6-1 prestressed, 3-73 bearing, 9-10 capacity, 2-2, 12-3 failure, 9-7 stress, E-3 bending, 6-1 lateral deflection, 6-1 prestressed, 3-73 bearing, 9-10 capacity, 2-2, 12-3 failure, 9-7 stress, E-3 bending, 6-1 lateral deflection, 6-1 prestressed, 3-73 masonry-arch, 2-74, 3-75, 4-17 masonry-arch deck, 4-27 movable, 3-81 bascule, 3-81 bascule, 3-81 bascule, 3-81 vertical-lift, 3-81 multiple-span, 3-8 multispan arch, 2-1 nail, 3-12 noncomposite steel-stringer, 3-26 nonengineered, 3-19 reinforced concrete box-girder, 3-64 ribbon, 1-3 semporament, 1-1	air photos, 2-3	failure, 6-1	substructures, 12-4
parallel to the grain, 9-2 perpendicular to the grain, 9-2 allowable pressure, 9-6 allowable shear stress, 3-20 allowable stress, 3-19, 3-23, 8-15, 9-7 steel, 3-25 timber, C-1 allowable vehicle shear, 3-21 American Association of State Highway and Transportation Officials, see AASHTO American Society for Testing and Materials, see ASTM analytical method, 1-4 anchor, 8-16 anchorage, 8-1 AO, 1-5 approach, 2-1 arraor of operation, see AO Artic and Subartic Environments, 12-1 armored vehicle-launched bridge, see AVLB lateral deflection, 6-1 shear, 6-1 vertical deflection, 6-1 prestressed, 3-73 bearing, 9-10 capacity, 2-2, 12-3 failure, 9-7 stress, E-3 bending, 11-17 bents, 2-1, 3-20 bolt spacing, 9-9 bracing, 3-12, 8-7 knee, 8-7 sway, 8-7 bridge, 1-1, 8-1, 8-2 approaches, 5-1 Bailey, 1-3 bolt, 3-12 box-girder, 3-65 bracing, 3-12 cantilever truss span, 3-8 composite-stringer, 3-26		bearing, 6-1	girder, 3-13
perpendicular to the grain, 9-2 allowable pressure, 9-6 allowable shear stress, 3-20 prestressed, 3-73 bearing, 9-10 capacity, 2-2, 12-3 failure, 9-7 stress, E-3 bending, 11-17 bending moment, 3-17 bending moment, 3-17 bending moment, 3-12 bolt spacing, 9-9 bracing, 3-12, 8-7 sway, 8-7 bridge, 1-1, 8-1, 8-2 approache, 2-1 armored vehicle-launched bridge, see AVLB shear, 9-2 shear, 9-2 timber, C-1 shear, 3-20 bolt, 3-12 cantilever truss span, 3-8 composite-stringer, 3-26 shear, 9-2 shear, 9-2 semipermanent, 1-1 masonry, 4-20 masonry, 4-20 masonry-arch, 3-74, 3-75, 4-17 masonry-arch, 3-74, 3-75, 4-17 masonry-arch deck, 4-27 movable, 3-81 bascule, 3-81 bascule, 3-81 bascule, 3-81 wertical-lift, 3-81 multiple-span, 8-2 multispan, 3-16 multispan arch, 2-1 nail, 3-12 noncomposite steel-stringer, 3-26 nonengineered, 3-19 reinforced concrete box-girder, 3-64 ribbon, 1-3 semipermanent, 1-1	maximum, 9-3	bending, 6-1	glue-laminated stringer, 3-21
allowable pressure, 9-6 allowable shear stress, 3-20 allowable stress, 3-19, 3-23, 8-15, 9-7 steel, 3-25 timber, C-1 allowable vehicle shear, 3-21 American Association of State Highway and Transportation Officials, see AASHTO American Society for Testing and Materials, see ASTM analytical method, 1-4 anchor, 8-16 anproach, 2-1 area of operation, see AO Artic and Subartic Environments, 12-1 armored vehicle-launched bridge, see AVLB Wertical deflection, 6-1 prestressed, 3-73 bearing, 9-10 capacity, 2-2, 12-3 failure, 9-7 stress, E-3 bending, 9-10 masonry-arch, 3-74, 3-75, 4-17 masonry-arch deck, 4-27 movable, 3-81 bascule, 3-81 bending moment, 3-17 bending moment, 3-10 moreograph, 3-16 multispen arch, 2-1 nail, 3-12 noncomposite steel-stringer, 3-26 nonengineered, 3-19 reinforced concrete box-girder, 3-64 ribbon, 1-3 semipermanent, 1-1 semipermanent, 3-17 mas	parallel to the grain, 9-2	lateral deflection, 6-1	handrail, 3-12
allowable shear stress, 3-20 allowable stress, 3-19, 3-23, 8-15, 9-7 steel, 3-25 timber, C-1 allowable vehicle shear, 3-21 American Association of State Highway and Transportation Officials, see AASHTO American Society for Testing and Materials, see ASTM analytical method, 1-4 anchor, 8-16 anchorage, 8-1 AO, 1-5 approach, 2-1 area of operation, see AO Artic and Subartic Environments, 12-1 armored vehicle-launched bridge, see AVLB prestressed, 3-73 bearing, 9-10 capacity, 2-2, 12-3 failure, 9-7 stress, E-3 bending, 11-17 bending moment, 3-17 bending, 9-10 masonry, 4-20 movable, 3-81 novable, 3-81 novable	perpendicular to the grain, 9-2	shear, 6-1	iron, 1-1
allowable stress, 3-19, 3-23, 8-15, 9-7 steel, 3-25 timber, C-1 allowable vehicle shear, 3-21 American Association of State Highway and Transportation Officials, see AASHTO American Society for Testing and Materials, see ASTM analytical method, 1-4 anchor, 8-16 anchorage, 8-1 AO, 1-5 approach, 2-1 area of operation, see AO Artic and Subartic Environments, 12-1 armored vehicle-launched bridge, see AVLB bearing, 9-10 capacity, 2-2, 12-3 failure, 9-7 stress, E-3 bending, 11-17 bents, 2-1, 3-20 bolt spacing, 9-9 bracing, 3-12, 8-7 knee, 8-7 sway, 8-7 bridge, 1-1, 8-1, 8-2 approaches, 5-1 Bailey, 1-3 box-girder, 3-65 bracing, 3-12 cantilever truss span, 3-8 composite-stringer, 3-26 masonry-arch, 3-74, 3-75, 4-17 masonry-arch deck, 4-27 movable, 3-81 bascule, 3-81 vertical-lift, 3-81 multiple-span, 8-2 multispan, 3-16 multispan arch, 2-1 nail, 3-12 noncomposite steel-stringer, 3-26 nonengineered, 3-19 reinforced concrete box-girder, 3-64 ribbon, 1-3 semipermanent, 1-1	allowable pressure, 9-6	vertical deflection, 6-1	M2 Bailey, 4-1
9-7 steel, 3-25 timber, C-1 allowable vehicle shear, 3-21 American Association of State Highway and Transportation Officials, see AASHTO American Society for Testing and Materials, see ASTM analytical method, 1-4 anchor, 8-16 anchorage, 8-1 AO, 1-5 approach, 2-1 area of operation, see AO Artic and Subartic Environments, 12-1 armored vehicle-launched bridge, see AVLB Acapacity, 2-2, 12-3 failure, 9-7 stress, E-3 bending, 11-17 bending moment, 3-17 bending moment, 3-1	allowable shear stress, 3-20	prestressed, 3-73	masonry, 4-20
timber, C-1 allowable vehicle shear, 3-21 American Association of State Highway and Transportation Officials, see AASHTO American Society for Testing and Materials, see ASTM analytical method, 1-4 anchor, 8-16 anchorage, 8-1 AO, 1-5 approach, 2-1 area of operation, see AO Artic and Subartic Environments, 12-1 armored vehicle-launched bridge, see AVLB failure, 9-7 stress, E-3 bending, 11-17 bending moment, 3-17 bending mo		bearing, 9-10	
timber, C-1 allowable vehicle shear, 3-21 American Association of State Highway and Transportation Officials, see AASHTO American Society for Testing and Materials, see ASTM analytical method, 1-4 anchor, 8-16 anchorage, 8-1 AO, 1-5 approach, 2-1 area of operation, see AO Artic and Subartic Environments, 12-1 armored vehicle-launched bridge, see AVLB movable, 3-81 bending, 11-17 bending moment, 3-17 bents, 2-1, 3-20 bolt spacing, 9-9 bracing, 3-12, 8-7 knee, 8-7 sway, 8-7 bridge, 1-1, 8-1, 8-2 approaches, 5-1 Bailey, 1-3 bascule, 3-81 vertical-lift, 3-81 multiple-span, 8-2 multispan, 3-16 multispan arch, 2-1 nail, 3-12 noncomposite steel-stringer, 3-26 nonengineered, 3-19 reinforced concrete, 3-60 reinforced concrete box-girder, 3-64 ribbon, 1-3 semipermanent, 1-1	-	capacity, 2-2, 12-3	
allowable vehicle shear, 3-21 American Association of State Highway and Transportation Officials, see AASHTO American Society for Testing and Materials, see ASTM analytical method, 1-4 anchor, 8-16 anchorage, 8-1 AO, 1-5 approach, 2-1 area of operation, see AO Artic and Subartic Environments, 12-1 armored vehicle-launched bridge, see AVLB bending, 11-17 bending, 12-1 reliable, 1-3-81 multiple-span, 8-2 multispan, 3-16 multispan, 3-10 multi	, and the second	failure, 9-7	•
American Association of State Highway and Transportation Officials, see AASHTO American Society for Testing and Materials, see ASTM analytical method, 1-4 anchor, 8-16 anchorage, 8-1 AO, 1-5 approach, 2-1 area of operation, see AO Artic and Subartic Environments, 12-1 armored vehicle-launched bridge, see AVLB bending moment, 3-17 bents, 2-1, 3-20 bolt spacing, 9-9 bracing, 3-12 bolt spacing, 9-9 bracing, 3-12, 8-7 knee, 8-7 sway, 8-7 bridge, 1-1, 8-1, 8-2 approaches, 5-1 Bailey, 1-3 bolt, 3-12 box-girder, 3-65 bracing, 3-12 cantilever truss span, 3-8 composite-stringer, 3-26		stress, E-3	
Highway and Transportation Officials, see AASHTO American Society for Testing and Materials, see ASTM analytical method, 1-4 anchor, 8-16 anchorage, 8-1 AO, 1-5 approach, 2-1 area of operation, see AO Artic and Subartic Environments, 12-1 armored vehicle-launched bridge, see AVLB bending moment, 3-17 bents, 3-17 vertical-lift, 3-81 multiple-span, 8-2 multispan, 3-16 multispan arch, 2-1 nail, 3-12 noncomposite steel-stringer, 3-26 nonengineered, 3-19 reinforced concrete, 3-60 reinforced concrete box-girder, 3-64 ribbon, 1-3 semipermanent, 1-1 sizes 5-4.		bending, 11-17	
Officials, see AASHTO American Society for Testing and Materials, see ASTM analytical method, 1-4 anchor, 8-16 anchorage, 8-1 AO, 1-5 approach, 2-1 area of operation, see AO Artic and Subartic Environments, 12-1 armored vehicle-launched bridge, see AVLB bents, 2-1, 3-20 bolt spacing, 9-9 bracing, 3-12, 8-7 knee, 8-7 sway, 8-7 bridge, 1-1, 8-1, 8-2 approaches, 5-1 Bailey, 1-3 bolt, 3-12 bridge, 1-1, 8-1, 8-2 approaches, 5-1 Bailey, 1-3 box-girder, 3-65 bracing, 3-12 cantilever truss span, 3-8 composite-stringer, 3-26		bending moment, 3-17	•
American Society for Testing and Materials, see ASTM analytical method, 1-4 anchor, 8-16 anchorage, 8-1 AO, 1-5 approach, 2-1 area of operation, see AO Artic and Subartic Environments, 12-1 armored vehicle-launched bridge, see AVLB bolt spacing, 9-9 bracing, 3-12, 8-7 knee, 8-7 sway, 8-7 bridge, 1-1, 8-1, 8-2 approaches, 5-1 Bailey, 1-3 bolt, 3-12 box-girder, 3-65 bracing, 3-12 cantilever truss span, 3-8 composite-stringer, 3-26 multispan, 3-16 multispan, 3-16 multispan arch, 2-1 nail, 3-12 noncomposite steel-stringer, 3-26 nonengineered, 3-19 reinforced concrete box-girder, 3-64 ribbon, 1-3 semipermanent, 1-1	- · ·	bents, 2-1, 3-20	
Materials, see ASTM analytical method, 1-4 anchor, 8-16 anchorage, 8-1 AO, 1-5 approach, 2-1 area of operation, see AO Artic and Subartic Environments, 12-1 armored vehicle-launched bridge, see AVLB bracing, 3-12, 8-7 knee, 8-7 sway, 8-7 bridge, 1-1, 8-1, 8-2 approaches, 5-1 Bailey, 1-3 bolt, 3-12 box-girder, 3-65 bracing, 3-12 cantilever truss span, 3-8 composite-stringer, 3-26 multispan, 3-16 multispan arch, 2-1 nail, 3-12 noncomposite steel-stringer, 3-26 nonengineered, 3-19 reinforced concrete box-girder, 3-64 ribon, 1-3 semipermanent, 1-1		bolt spacing, 9-9	
anchor, 8-16 anchorage, 8-1 AO, 1-5 approach, 2-1 area of operation, see AO Artic and Subartic Environments, 12-1 armored vehicle-launched bridge, see AVLB anchor, 8-16 sway, 8-7 bridge, 1-1, 8-1, 8-2 approaches, 5-1 Bailey, 1-3 bolt, 3-12 box-girder, 3-65 bracing, 3-12 cantilever truss span, 3-8 composite-stringer, 3-26 noncomposite steel-stringer, 3-26 nonengineered, 3-19 reinforced concrete, 3-60 reinforced concrete box-girder, 3-64 ribbon, 1-3 semipermanent, 1-1		bracing, 3-12, 8-7	•
anchorage, 8-1 AO, 1-5 approach, 2-1 area of operation, see AO Artic and Subartic Environments, 12-1 armored vehicle-launched bridge, see AVLB bridge, 1-1, 8-1, 8-2 approaches, 5-1 Bailey, 1-3 bolt, 3-12 box-girder, 3-65 bracing, 3-12 cantilever truss span, 3-8 composite steel-stringer, 3-26 noncomposite steel-stringer, 3-26 nonengineered, 3-19 reinforced concrete, 3-60 reinforced concrete box-girder, 3-64 ribbon, 1-3 semipermanent, 1-1	analytical method, 1-4	knee, 8-7	•
AO, 1-5 approach, 2-1 area of operation, see AO Artic and Subartic Environments, 12-1 armored vehicle-launched bridge, see AVLB 3-26 nonengineered, 3-19 reinforced concrete, 3-60 reinforced concrete box-girder, 3-65 bracing, 3-12 cantilever truss span, 3-8 composite-stringer, 3-26	anchor, 8-16	sway, 8-7	
AO, 1-5 approach, 2-1 area of operation, see AO Artic and Subartic Environments, 12-1 armored vehicle-launched bridge, see AVLB approaches, 5-1 Bailey, 1-3 bolt, 3-12 box-girder, 3-65 bracing, 3-12 cantilever truss span, 3-8 composite-stringer, 3-26 approaches, 5-1 nonengineered, 3-19 reinforced concrete, 3-60 reinforced concrete box-girder, 3-64 ribbon, 1-3 semipermanent, 1-1	anchorage, 8-1	bridge, 1-1, 8-1, 8-2	· · · · · · · · · · · · · · · · · · ·
approach, 2-1 area of operation, see AO Artic and Subartic Environments, 12-1 armored vehicle-launched bridge, see AVLB Balley, 1-3 bolt, 3-12 reinforced concrete, 3-60 reinforced concrete box-girder, 3-64 ribbon, 1-3 semipermanent, 1-1	AO, 1-5	approaches, 5-1	
Artic and Subartic Environments, 12-1 armored vehicle-launched bridge, see AVLB bolt, 3-12 box-girder, 3-65 bracing, 3-12 cantilever truss span, 3-8 composite-stringer, 3-26 reinforced concrete box-girder, 3-64 ribbon, 1-3 semipermanent, 1-1	approach, 2-1	Bailey, 1-3	-
Artic and Subartic Environments, 12-1 armored vehicle-launched bridge, see AVLB box-girder, 3-65 bracing, 3-12 cantilever truss span, 3-8 composite-stringer, 3-26 box-girder, 3-64 ribbon, 1-3 semipermanent, 1-1	area of operation, see AO	bolt, 3-12	
armored vehicle-launched bridge, see AVLB bracing, 3-12 cantilever truss span, 3-8 composite-stringer, 3-26 ribbon, 1-3 semipermanent, 1-1		box-girder, 3-65	
armored vehicle-launched bridge, see AVLB cantilever truss span, 3-8 semipermanent, 1-1 composite-stringer, 3-26		bracing, 3-12	
composite-stringer, 3-26		cantilever truss span, 3-8	
		composite-stringer, 3-26	signs, 5-1
Army Facilities Components System, see AFCS concrete, 1-1 signs, 5-1 simple steel, 2-1	•	concrete, 1-1	•
assembly sites, 2-3 concrete-stringer, 2-1 simply supported, 3-16		concrete-stringer, 2-1	•
continuous span, 3-16, 3-17	, 555, 2.0	continuous span, 3-16, 3-17	1.2 11.5

slab, 3-56, 3-60	moment, 3-12	compressive strength, 6-8
span, 3-13	moment capacity, 3-15	mass-concrete structures, G-4
steel, 1-1	shear, 3-12	poststressed, G-8
steel-arch, 3-8	camber, 8-3, 8-4	prestressed, 3-15, G-8
steel-girder, 3-83	capacity, load-carrying, 4-1	reinforced, 3-26
stringer, glue-laminated, 3-21	cement types, G-2	steel-reinforced, G-4
suspension, 2-1, 3-8, 3-82,	classification, 1-1, 3-1	T-beam, 3-65
3-83, 8-1	concrete, 1-2	connection, 1-1, 4-7, 9-1
T-beam, 3-59, 3-60	correlation-curve method,	bolt, 4-15
timber stringer, 3-18, 3-20	3-49	reinforcement, 4-12
glue-laminated, 3-18	deck, 3-22	rivet, 4-15
laminated, 3-18	dual, 5-2	weld, 4-15
plank, 3-18	floor beam, 3-49	construction, 10-1
truss, 2-1, 3-8, 3-46, 3-49	live load, 3-55	composite, 3-55, 3-66
abutment, 3-48	method, 3-1	concrete-deck, 3-67
anchor, 3-48	moment, 3-16, 3-35, 3-59	dead load, 3-67
cantilever, 3-48	procedure, 3-65, 3-74	expedient ice-bridge, 12-18
deck, 3-48	shear, 3-67	noncomposite, 3-66
pier, 3-48	steel, 1-2	precautions, 10-27
pony, 3-46	stringer, 3-49	scheduling, 10-7
through, 3-47	suspension, 1-2	suspension-bridge, 10-29
bridge components, 3-11	timber, 1-2	construction site, 4-1
deck, 3-11	truss, 3-54	continuous span bridge, 3-17
timber decking, 3-11	classification examples	conversion charts, A-1
bridge height, 2-3	composite steel-concrete	correlation curve, 3-3
bridges	stringer bridge, F-11	correlation method, 3-8
nonstandard fixed, 1-4	masonry-arch bridge, F-48	cradle and flare, 8-3, 8-4
standard, 1-3	prestressed concrete bridge,	cross section, 3-12
bridge site, 2-1, 8-2	F-43	curb-to-curb roadway width, 3-50
bridge structure, 2-1	reinforced concrete-box-girder	CZ, 1-4
bridging in arctic and subarctic	bridge, F-39 reinforced concrete-slab	02,11
environments, 12-1	bridge, F-31	D
bulldozer, 1-5	reinforced concrete T-beam	damage, 1-2
bypass, 2-1	bridge, F-35	dams, 2-2
С	steel-girder bridge, F-17 steel-stringer bridge, F-8	dead load, 3-12, 3-67, 4-12, 4-20, 7-2, E-1
cable, 8-1	timber-stringer bridge, F-4	computation, 3-49
cable, suspender, 8-1	truss bridge, F-24	decking, 3-12
cableways, 10-14	combat zone, see CZ	moment, 3-15
calculation	composite construction, 3-26, 3-55	moment per component, 3-15
allowable bending stress, 3-15	compressive stress, E-2	span length, 3-15
bending-moment, 3-11	•	total per stringer, 3-15
dead load, 3-12, 3-13	computation, dead-load, 3-49	uniformly distributed, 3-15
live load, 3-13	concealment, 2-2	deadman, 8-20
	concrete, 3-15, 3-55, G-1	doddinan, 0-20

deck, 1-3	backstay slope, 8-3, 8-4	tensile strength, 9-12
bridge, 3-9	camber, 8-3, 8-4	falsework, 10-15
classification, 3-22	cradle and flare, 8-3, 8-4	bents, 10-15
clear distance, 6-4	sag ratio, 8-3	platforms and scaffolding,
concrete-box-girder, 3-10	load, 3-3, 6-1	10-15
concrete on concrete T-beam,	methods, 1-3	trestles, 10-15
3-10	procedures, 7-1, 9-1	floor beam, 3-36, 4-11, 8-6
concrete on steel I-beam	process, 6-1	floor-beam reaction, 3-45
stringer, 3-10	suspension-bridge, 8-1	floor clips, 9-8
concrete on timber stringer, 3-10	detours and bypasses, 1-2	flow, 4-20
design, 6-4	diagrams, E-10	footings, 2-3
floor stringer, 3-9	moment, E-13, E-18	force
glue-laminated, 3-10	shear, E-11, E-16	allowable tensile, 3-51
laminated, 6-5, 6-6	double-story configuration, 1-3	bending, 3-46
maintenance, 11-15	dual classification, 5-2	compression, 3-46
nail-laminated, 3-10	_	dead-load shear per stringer, 3-21
plank, 3-10, 6-5, 6-6	E	horizontal, 4-20
prestressed concrete girder,	earth pressure, 7-5	,
3-10	effective shear, D-12	horizontal shear, 3-20 live-load shear capacity, 3-2
reinforced concrete, 6-7	effective shear area, 3-20, 3-43	moment classification, 3-20
repair, 4-5	effective span length, 6-4, 6-5	shear capacity, 3-20
required thickness, 6-6	equivalent span length, 3-8, 3-48	shear capacity per stringer,
steel arch, 3-9	examples	3-21
thickness, 3-22	classification, F-1	tension, 3-46
timber, 6-5	design, I-1	forces
wearing surface, 6-4	expedient	soil, 7-5
decking, 2-2, 3-12	bridge, 1-3	temperature, 7-6
deflection, 4-7	classification procedure, B-20	water, 7-6
demolished bridge, 1-1, 2-4	crossing, 2-2	fords, 1-2, 4-1
demolition, 2-1	field design, 8-12	foundation, 10-3, 11-17
derricks, 10-14	explosives, 12-3	abutments, 11-17
design, 1-1, 2-2, 6-4, 8-1, 8-3	accessories, 12-3	concrete, 11-18
abutment procedures, 7-1	commercial, 12-3	steel, 11-17
criteria, 9-6	military, 12-3	timber, 11-17
allowable stresses, 9-7	F	·
allowable tensile, 9-7	failure, 1-2	G
bolted connections, 9-6	beam, 6-1	girder, 1-3, 3-12
examples, I-1	mode, 6-1, 9-10	continuous-span structure,
steel-stringer bridge with	bearing, 9-10	3-11
a concrete deck, I-9	end bearing, 6-1	moment classification, 3-31
timber-stringer bridge	excessive deflection, 6-1	plate, 3-11
with a timber deck, I-3	lateral buckling, 6-1	reinforced concrete beam,
expedient field, 8-12	shear, 9-10	3-11
factor, 8-3	5110di, 0 10	steel, 3-11

grade, 3-19	lamination, 6-6	military operation, 1-1
gravel, 2-6	moment, 3-9, 3-28, 3-35, 3-59	MLC, 1-3, 3-1, B-1
grillage, 10-9	total moment capacity, 3-16	one-way, 3-9
gross weight, 8-8	load, 3-1, 3-3, 7-1	two-way, 3-9
guy line, 8-16	abutment, 7-1	modulus of elasticity, 3-15, 8-15
	capacity, 4-14	moisture content, 3-19
н	dead, E-1	moment
handrails, 9-1	design, 3-3, 6-1	capacity, 3-15, 3-49, 3-55
hanger cable, 3-9	footing, 7-1	classification, 3-16
Hankinson formula, 9-2	horizontal, 7-4	dead load, 3-15, 3-16, 3-73
hasty method, 2-1	impact, 8-8, E-1	diagram, E-13, E-18
hoists, 10-14	live, 3-16, 4-20, 6-6, E-1	internal, E-10
horizontal loads, 7-4	pile, 7-1	live-load, 3-9, 3-16, 3-28,
hydration, G-2	post, 7-1	3-35, 3-59
hydrostatic uplift, 7-4	superstructure dead, 7-2	moment classification, 3-35, 3-59
hypothetical vehicles, B-1	vertical, 7-1	moment classification, girder, 3-31
•	load-carrying capacity, 1-1	moment of inertia, D-15
	loads, 2-5	moment stress, E-4
impact	LOC, 1-1	MOS, 1-5
factor, 3-16, 3-35	locks, 2-2	MSR, 11-11
load, 8-8, E-1		N
inspection, 3-12, 11-11	М	
equipment, 11-12	M2 Bailey bridge, 1-3, 4-1	NATO, 3-13, 3-18, 5-6, B-1
items, 11-12	main cable, 8-9	neutral axis, 3-56, D-12
mission, 11-11	main supply route, see MSR	nonstandard fixed bridges, 1-4
intermediate support, 2-1	maintenance, deck, 11-15	North Atlantic Treaty Organization, see NATO
internal	map	366 NATO
moment, E-10	geologic, 2-3	О
reactions, E-8	topographic, 2-3	obstacle, 2-1, 2-5
shear force, E-9	maximum allowable load, 9-3	OCONUS, 1-4
J	medium-girder bridge, see MGB	outside continental US, see
jacks, 10-14	members, 1-1	OCONUS
jacks, 10-1 4	method, 3-1	overhead
K	analytical, 3-1	bracing, 3-55
knee brace, 4-11, 9-1	analytical load-classification,	clearance, 2-1, 2-2, 3-55
knee bracing, 8-7	3-67	overload, 1-2
5 ,	classification, 3-1	_
L	correlation, 3-8	P
lamination, live-load, 6-6	MGB, 1-3	permafrost, 12-1
lanes, 2-2	military load, 1-1	excavated foundation, 12-10
launching nose, 10-22	military-load classification, see MLC	foundation survey, 12-7
layout, 2-3, 10-9		intermediate supports, 12-8
lines of communication, see LOC	military occupational specialty, <i>see</i> MOS	nonexcavated foundation,
live load, 3-16, 4-20, 6-6, E-1		12-11

pile bents, 12-8	tension members, 4-15	shear stress, E-4
picket holdfast, 8-16	trestle bent, 4-8	signs, 5-2
pier, 2-4	truss, 4-11, 4-14	bridge, 5-1
pile piers, 2-1	repair, 1-1, 4-4	bridge-classification, 5-1
plank deck, 6-6	abutment, 4-18	North Atlantic Treaty
posting, 5-1	A-frame, 4-10	Organization, see NATO
prestressed	damaged member, 4-17	rectangular, 5-4
beam, 3-73	debris, 4-18	temporary, 5-3
concrete beam, 3-66	deck, 4-5	simply supported, 3-16
profile	flooring, 4-17	slab, reinforced concrete, 3-55
rock, 2-4	footing, 4-6, 4-10	slenderness ratio, 4-15
soil, 2-4, 2-5	knee brace, 4-11	soil, 3-11, 7-3, H-1
properties	masonry-arch bridge, 4-20	forces, 7-3
concrete, G-1	masonry pier, 4-18	properties, 2-5
end-bearing H-piles, D-4	noncontinuous stringer, 4-7	sample, 2-3
rolled angles, D-6	pier failure, 4-6	spacing, 9-7
rolled beams, steel, D-3	shear, 4-7	bolt, 9-7, 9-9
rolled channels, D-5	substructure, 4-10	span, 2-2, 8-1
round beams, timber, C-10	superstructure, 4-6	bending moment, 3-17
soil, H-1	timber pier, 4-6	continuous, 3-17
steel stringers, D-9	truss, 4-11	length, 3-3, 3-9
unequal-leg angles, D-7	required deck thickness, 6-6	effective, 6-4, 6-5
	retaining wall, 12-12	equivalent, 3-8
R	ribbon bridge, 1-3	special equipment, 10-13
radius of gyration, D-19	river-crossing operation, 1-3	species, 3-19
railroad, 2-3	road, curb-to-curb roadway width,	standard, 1-3
reconnaissance, 1-1, 2-1, 3-49,	3-50	Standard Specifications for
10-1	road network, 1-1	Highway Bridges, AASHTO's,
deliberate, 2-1	rolled shapes, 3-22	1-3, 3-1
hasty, 2-1		static equilibrium, E-6
reinforced concrete slab, 3-55	S	steel, 2-3, 3-15, D-1
reinforcement, 1-1, 4-1	saddle, 8-16	connections, 9-10
abutment, G-8	safety factor, 8-8, C-1	end-bearing H-piles, D-4
beam, G-4	sag ratio, 8-3	high-strength, D-1
bypass, 4-1	sand, 2-6	reinforcing, 3-57
column, G-6	scheduling, 10-6	reinforcing bar, 3-55, D-5
compression member, 4-13	scheduling, construction, 10-7	reinforcing yield strength, 6-9
detour, 4-1	scour, 3-11, 4-6, 11-17	rolled angles, D-6
footing, G-6	section modulus, 3-15, 3-22, D-17	rolled beams, D-3
intermediate support, 4-12	semipermanent bridge, 1-1	rolled channels, D-5
load capacity, 4-14	settlement, 3-11	stringers, D-9
retaining-wall, G-8	shear, 3-67, 9-10	unequal-leg angle, D-7
slab-deck, G-5	shear diagram, E-11, E-16	yield strength, 3-57
stringer, 4-9	shear force, internal, E-9	stream, 4-20

stress, E-1 theater of operations, see TO weld types, 9-13 tie rod, 4-21, 4-22 allowable, 8-15 butt weld, 9-13 allowable bending, 3-26 I-beam, 4-22 fillet weld, 9-15 allowable horizontal-shear, pier, 4-22 wing wall, 4-18 3-20 steel plate, 4-22 Υ bearing, 3-15, E-3 timber, 2-3, 2-6, 3-15, 4-17, C-1 compressive, E-2 yield point, 3-15 allowable loads, C-1 deflection, 3-15 yield strength, 3-57, 6-9 allowable stresses, C-1 moment, E-4 yield strength, steel, 3-23 connections, 9-1 shear, E-4 bolts, 9-1, 9-3 stresses, 1-5, 9-1 fastener, 9-1 stresses, allowable, 9-7 nails, 9-1 stringer, 2-2, 2-4, 3-8, 3-12, 3-13 spikes, 9-1 effective, 3-14 load direction, C-1 effective number, 3-21 grade, C-1 steel, 3-22, 3-55, properties timber, 3-13 rectangular beams, C-9 vehicular loading, 3-12 round beams, C-10 structural mechanics, E-1 select structural grade, C-1 structure, bridge, 1-1 solid-sawn, 3-20 substructure, 1-1, 3-10, 3-11, 7-1, species, C-1 9-1, 10-1 strength, C-1 subsurface, 2-6 timber deck, 3-22, 6-5 superstructure, 1-1, 1-3, 3-10, laminated, 3-22 3-11, 3-83, 10-1 plank, 3-22 abutment weight, 7-3 TO, 1-1, 5-2 connections, 3-11 tools and equipment, 10-10 dead load, 7-2 hand tools, 10-13 superstructure design, I-1 towers, 8-1, 8-13 support traffic controls, 5-5 bearing plate, 3-12 truss, 3-12 roller, 3-12 inverted king, 4-9 suspenders, 8-8 inverted queen, 4-9 suspenders, cable, 8-1 reinforcement and repair, 4-11 sway bracing, 8-7 W Т washers, 9-7 tactical bridging, 2-1 washers, bearing failure, 9-7 T-beam, concrete, 3-65 water forces, 7-6 TCMS, 1-4 wearing surface, 4-17 temperature forces, 7-6 welding process, 9-12 tensile strength, 9-12 electric-arc, 9-12 test pits, 2-5 oxyacetylene, 9-12 **Theater Construction Management** welds, 9-12 System, see TCMS